

DIVISION 15 - MECHANICAL

Section 15850 - Ductwork Accessories

Introduction

Equipment associated with:

AIR HANDLING SYSTEMS INCLUDING TERMINAL UNIT (TU)

Part 1 - General

- TU test submittal data shall be in accordance with ADC/ARI Standard 880.
- TU controllers to be compatible with Campus EMCS. (See Section 15970)

Part 2 - Products

- TU selection criteria is presented in Table 1. Only unit sizes listed are to be used on University projects (no odd size inlet ducts are used)

Table 1

DSS Terminal Units Selection Criteria			
Primary Air (CFM)			
Inlet Size	Max flow Range		Min Flow ⁽¹⁾
4 ⁽²⁾	100	180	40
6	185	340	90
8	330	640	160
10	530	1,000	250
12	780	1,500	360
14	1,100	2,200	490
16	1,450	2,900	640
24x16 ⁽³⁾	2,900	5865	1,215

Table Notes:

1. This flow is the minimum for stable control.
2. Temperature control zones this small should be avoided.
3. This box size should be avoided whenever possible - consider multiple units as this unit typically requires higher inlet static pressure.

TU Selection Guidance:

- The Design professional must consider the space noise criteria when selecting the specific box for their project.
- Using these selections should reduce the need for sound attenuators. It is desirable not to install sound attenuators unless it is required for room performance.
- Emphasis should be on efficient duct designs both inlet and outlet configurations.
- TUs should be targeted for a peak inlet velocity between 1,700 and 2,000 ft/min. Inlet velocities may be outside of this range where necessary. Under no circumstances shall peak inlet velocities exceed 2,200 ft/min. Consider operational flexibility and future growth (planned or otherwise) when making TU selections.
- TU minimum inlet velocities shall not fall below that reliably measurable (controllable) by the associated flow

sensing device. Note that the utilized flow sensing technology minimums and manufacturer's listed TU minimum do not always align. Utilize the most stringent (highest controllable minimum) requirement.

- All TUs shall include a discharge air temperature sensor integrated into the BAS.

Reheat Coil Guidance

- See Section 15540 for heating water system temperatures.
- All coils to be 10 fins per inch maximum (standard coils).
- 1 row coils provide the least air pressure drop and should be the priority coil selected unless space load requires higher
- No more than 2 rows should be specified without UA approval (it is recommended the water flow and temperature drop be adjusted rather than specify more rows).
- Reheat coils should have a minimum Leaving Air Temperature (LAT) of 80 F at heating max airflow (to support morning warm up).
- See Section 15510 for discussions on preferred flow control approaches (e.g. PICVs and circuit setters).
- The airflow required for heating is not required to be the same as minimum primary airflow or an arbitrary percentage of max flow.
- The DP should recognize that using an arbitrary percentage of design flow may not result in providing the maximum heat to the space.
- All single deck terminal unit (TU) controls shall at a minimum have 3 airflow set points: TU minimum, TU maximum, and heating maximum. Single deck reheat systems shall also have a user adjustable maximum discharge air temperature set point. Single deck reheat boxes shall first close to minimum airflow to prevent overcooling the space, then modulate the reheat valve upon a call for heating, then increase to heating maximum airflow upon a further call for heating.
- Dual deck TU controls shall be evaluated on a case-by-case basis in relation to their associated control sequence. Consult with UFS Commissioning Team and Mechanical Engineer.

Specification items

- Generally, the manufacturer's standard 22-gauge construction is acceptable with the following options/clarifications:
 - Units to be tested and AHRI 880 certified.
 - Coils to be rated per AHRI 410.
 - **No fibrous duct liner** - Unit casing shall be lined with minimum 1/2 thick insulation, 1 1/2 lb. density, smooth surface, polyolefin, closed-cell foam insulation or UFS Engineer approved equivalent fiber free application. Insulation shall meet UL 181 and NFPA 90A and not support mold or bacterial growth. Insulation shall be attached to the unit casing by adhesive and weld pins.
 - Provide access door upstream of heating coil attached with screws.
 - Coils shall be max 10 fins per inch.
 - Unit casing leakage to be tested per ASHRAE standard 130 and not exceed 2% of the maximum rated airflow at 3 iwg pressure.
 - Provide enclosure for unit mounted controls.
 - Controllers to be same manufacturer as the EMCS system. Factory mounting is preferred but should be left as a contractor /project option.

Coordination Items

- Design drawings to show location of 24v power supplies (by EMCS) – electrical drawings to show power connection and to provide feeder.
- Preference is not to bring 120 V to each box but to feed with low voltage.
- Controls must comply with Section 15970, associated appendix, and other sections of the DSS.

- Show location of reheat coil connections as well as control box location.
- Locate boxes so that they can be accessed by a ladder.
- Only locate above accessible ceilings (accessible requires the ceiling to be non-progressive or to not require disassembly for access).

Part 3 - Execution

- Do not reuse existing pneumatic terminal boxes when designing a space remodel.
- Install terminal boxes with minimum of 18" clearance access for service and maintenance.
- Fire dampers and fire-smoke dampers to be installed in accordance with manufacturer's installation instructions.

End of Section 15850